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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/555,559	05/31/2000	RICHARD ALLAN TUCK	670-1003	9227

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EXAMINER

QUARTERMAN, KEVIN J

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 04/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/555,559

Applicant(s)

TUCK ET AL.

Examiner

Kevin Quarterman

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 09 January 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) g.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's Amendment B, filed 06 January 2003, has been entered and overcomes the objections to the specification and drawings.

Drawings

2. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 06 January 2003, have been approved.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).
5. Claims 1-61 are rejected under 35 U.S.C. 102(e) as being anticipated by Tuck (US 6097139).

6. Regarding independent claim 1, Figure 5 of Tuck teaches a method of forming a field electron emission material comprising the step of disposing on a substrate (24) having an electrically conductive surface a plurality of electrically conductive particles (26), each with a layer of electrically insulating material (25) disposed in a first location between the conductive surface and the particle, or in a second location between the particle and the environment in which the field electron emission material is disposed, but not in both of the first and second locations (Step 2), such that at least some of the particles form electron emission sites at the first or second locations where the electrically insulating material is disposed.
7. Regarding claims 2-4, Tuck disclose the dimension of the particles normal to the conductive surface being at least 10 times greater than the thickness of the insulating material (col. 3, ln. 42-45).
8. Regarding claim 5, Tuck disclose the thickness of the insulating material being of the order of 10nm and the particle dimension being in the range of $0.1\mu\text{m}$ to $400\mu\text{m}$ (col. 3, ln. 46-51).
9. Regarding claim 6, Tuck disclose a substantially single layer of conductive particles each having their dimension substantially normal to the surface in the range of $0.1\mu\text{m}$ to $400\mu\text{m}$ (col. 3, ln. 49-51).
10. Regarding claim 7, Tuck disclose that the insulating material comprises a material other than diamond (col. 3, ln. 52-53).
11. Regarding claims 8-9, Tuck disclose that the insulating material is an inorganic material including glass (col. 3, ln. 54-57).

12. Regarding claim 10, Tuck disclose that each electrically conductive particle is substantially symmetrical (col. 4, ln. 4-5).
13. Regarding claim 11, Tuck disclose that each electrically conductive particle is of substantially rough-hewn cuboid shaped (col. 4, ln. 6-7).
14. Regarding claim 12, Figure 4 of Tuck shows the electrically conductive particle having a substantially spheroid shape with a textured surface.
15. Regarding claim 13, Tuck disclose that the conductive particles are each aligned with their longest dimension substantially normal to the substrate (col. 4, ln. 8-11).
16. Regarding claim 14, Tuck disclose the conductive particles having a mutual spacing of 5 to 15 times their longest dimension (col. 4, ln. 12-14).
17. Regarding claim 15, Tuck disclose that each of the conductive particles may be silicon carbide (col. 4, ln. 45-49).
18. Regarding claim 16, Tuck disclose that each of the conductive particles is partially covered in the insulating material (col. 4, ln. 50-53).
19. Regarding claims 17-18, Tuck disclose that the emitter may be applied by screen-printing prepared ink (col. 8, ln. 56-58).
20. Regarding claim 19, Tuck disclose that the material may be applied in a photosensitive binder (col. 8, ln. 52-56).
21. Regarding claim 20, Tuck disclose a step of forming the material by sintering a mixture of particles (col. 5, ln. 1-5).
22. Regarding claim 21, Tuck disclose the insulating material comprising a glass (col. 5, ln. 17-19).

Art Unit: 2879

23. Regarding claim 22, Tuck disclose the conductive particle comprising a fiber chopped into a length longer than its diameter (col. 4, ln. 1-3).
24. Regarding claim 23, Figure 6 of Tuck shows the particles being formed by the deposition of the conducting layer upon the insulating layer and subsequent patterning to form isolated islands.
25. Regarding claim 24, Tuck disclose that the particles may be applied by a spraying (col. 8, ln. 58-63).
26. Regarding claim 25, Figure 6 of Tuck shows the conductive particles formed by depositing a layer that crazes into isolated raised flakes.
27. Regarding claim 26, Tuck disclose that the conducting layer comprises a semiconductor (col. 4, ln. 45-49).
28. Regarding claims 27-35, Figures 3-5 of Tuck show random and uniform distribution sites over the field electron emission material.
29. Regarding independent claim 36, Tuck disclose the limitations of independent claim 1, as described above.
30. Regarding independent claim 37, Tuck disclose the limitations of claim 36, as described above, and also disclose means for subjecting the material to an electric field in order to cause the material to emit electrons.
31. Regarding claim 38, Figure 4 of Tuck shows a substrate (17) with an array of emitter patches (19) of the field electron emission material and control electrodes (21) with aligned arrays of apertures, which electrodes are supported above the emitter patches by insulating layers.

Art Unit: 2879

32. Regarding claim 39, Tuck disclose that the apertures may be in the form of slots (col. 5, ln. 50).
33. Regarding claim 40, Tuck disclose that the field electron emission device may comprise an electron source (col. 5, ln. 55-57).
34. Regarding claim 41, Tuck disclose that the field electron emission material supplies the total current for operation of the device (col. 5, ln. 58-59).
35. Regarding claim 42, Tuck disclose that the field electron emission material supplies a starting current for the device (col. 5, ln. 60-61).
36. Regarding claim 43, Tuck disclose that the field electron emission device may comprise a display device (col. 5, ln. 63-64).
37. Regarding claim 44, Tuck disclose that the field electron emission device may comprise a lamp (col. 5, ln. 65-66).
38. Regarding claim 45, Tuck disclose that the lamp is substantially flat (col. 5, ln. 67).
39. Regarding claim 46, Tuck disclose an electrode plate supported on insulating spacers in the form of a cross-shaped structure (col. 6, ln. 1-3).
40. Regarding claim 47, Tuck disclose that the field electron emission material is applied in patches that are connected in use to an applied cathode voltage via a resistor (col. 6, ln. 4-6).
41. Regarding claim 48, Tuck disclose that the resistor is applied as a resistive pad under each emitting patch (col. 6, ln. 7-8).

Art Unit: 2879

42. Regarding claim 49, Tuck disclose a respective resistive pad is provided under each emitting patch such that the area of each resistive pad is greater than that of the respective emitting patch (col. 6, ln. 9-11).

43. Regarding claim 50, Tuck disclose that the emitter material and/or phosphor is/are disposed upon one or more one-dimensional array of conductive tracks which are arranged to be addressed by electronic driving means so as to produce a scanning illuminated line (col. 6, ln. 12-15).

44. Regarding claim 51, Tuck disclose that the field electron emission device may include the electronic driving means (col. 6, ln. 16-17).

45. Regarding claim 52, Tuck disclose that the environment may be gaseous, liquid, solid, or a vacuum (col. 6, ln. 19-20).

46. Regarding claim 53, Tuck disclose a gettering material within the device (col. 6, ln. 21-22).

47. Regarding claim 54, Tuck disclose the gettering material being affixed to an anode of the device (col. 6, ln. 24).

48. Regarding claim 55, Tuck disclose that the gettering material may be affixed to a cathode of the device (col. 6, ln. 25).

49. Regarding claim 56, Tuck disclose that the field electron emission material is arranged in patches and the gettering material is disposed within the patches (col. 6, ln. 26-28).

50. Regarding claim 57, Tuck disclose the field electron emission device comprising an anode, a cathode, spacer sites on the anode and cathode, spacers located at at

Art Unit: 2879

least some of the spacer sites to space the anode from the cathode, and the gettering material located on the anode at others of the spacer sites where spacers are not located (col. 6, ln. 29-34).

51. Regarding claim 58, Tuck disclose that the spacer sites are at a regular or periodic mutual spacing (col. 6, ln. 40-41).

52. Regarding claim 59, Tuck disclose that a cathode of the device is optically translucent and so arranged in relation to an anode that electrons emitted from the cathode impinge upon the anode to cause electroluminescence at the anode (col. 42-47).

53. Regarding claims 60-61, Tuck disclose that the conducting layer comprises a semiconductor (col. 4, ln. 45-49).

Response to Arguments

54. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Contact Information

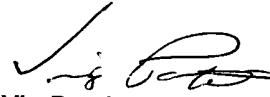
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Quarterman whose telephone number is (703) 308-6546. The examiner can normally be reached on M-F (8-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (703) 305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Kevin Quarterman
Examiner
Art Unit 2879

kq 
March 25, 2003


Vip Patel
Primary Examiner
Art Unit 2879